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IDAHO DEPARTMENT OF HEALTH & WELFARE

MRSA and RSV: Changes to Idaho laws

Contributed by the Office of Epidemiology & Food Protection

In response to new strains of methicillin-resistant *Staphylococcus aureus* (MRSA) in community settings, outbreaks of MRSA in the United States in certain groups, and a recent JAMA article reporting more invasive MRSA than had previously been suspected, changes to Idaho law were approved by the legislature this year.

In the past, although individual healthcare facilities in Idaho tracked MRSA rates, no statewide tracking was done. Local and state public health offices have assisted persons with questions about MRSA, and given advice to schools, long-term care facilities, and other institutions, but no restrictions for persons with MRSA infections have been mandated in state law, other than for foodhandlers.

Under the new rules, invasive MRSA, defined as MRSA isolated from a normally sterile site, is now reportable to public health in Idaho **by laboratories**, but is not required for physicians or other healthcare providers.

Sterile sites are defined as isolates from the following sources: **blood, cerebrospinal fluid (CSF), joint (synovial) fluid, pleural fluid, peritoneal fluid, pericardial fluid, or from internal organs including bone.**

In addition to the new requirement to report invasive MRSA, respiratory syncytial virus (RSV) infections will also be reportable to public health in Idaho by laboratories beginning in 2008. Surveillance of RSV will aid public health in communicating current levels of RSV activity in Idaho and help guide decisions on timing of administration of prophylaxis to high risk children.

Laboratory reporting rules apply to any medical diagnostic laboratory inspected, licensed, or approved by the Idaho Department of Health and Welfare or licensed according to the provisions of the Clinical Laboratory Improvement Act by the United States Health Care and Financing Administration. This includes the Idaho Bureau of Laboratories and laboratories at the United States Centers for Disease Control and Prevention.

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Web Links

- http://www.epi.idaho.gov

More information about reportable diseases

- http://adm.idaho.gov/adminrules/rules/idapa16/0210.pdf

Current rules and regulations governing Idaho reportable disease

MRSA – Innocent or Indicted? IBL Can Help You Decide

Vivian Lockary and Christopher Ball, Ph.D

For over two decades, laboratorians have been working in the background, diagnosing and tracking the prevalence of methicillin-resistant *Staphylococcus aureus* (MRSA). Surveillance and educational efforts have shifted from an institutional focus toward outpatient settings and the public[1]. Although a prominent concern in most health care settings, invasive MRSA has only recently reached public awareness through media attention[2].

As with *Salmonella, Shigella* and *E. coli*, MRSA "DNA fingerprinting" by Pulsed-Field Gel Electrophoresis (PFGE) supports epidemiological cluster investigation and contributes to nosocomial and community surveillance. Unique PFGE "fingerprints" (see figure 1) are numbered and organized into clonal groups which can be compared to previously-published patterns described as predominantly health care-associated (HA) or community-associated (CA) based epidemiological associations[3]. Voluntary passive surveillance of over 100 isolates has identified 40 different patterns in Idaho to date. In addition to PFGE, the IBL molecular lab includes *PVL* (Panton-Valentine Leukocidin) gene detection and SCC*mec* type (Staphylococcal Chromosomal Cassette) determinations (see figure 2) to create a genotypic profile of each isolate. Along with microbiologic and epidemiologic data, genetic profiling helps to describe circulating MRSA strains and identify those with the greatest public health impact.

With increased participation, IBL's molecular epidemiology methods can help provide answers to questions about the relative frequency and geographic distribution of each clonal group in Idaho.

For infection control practitioners, epidemiologists, and health care providers alike, genetic profiling helps distinguish between outbreak and sporadic patterns within health care or community settings and facilitates awareness of MRSA prevention.

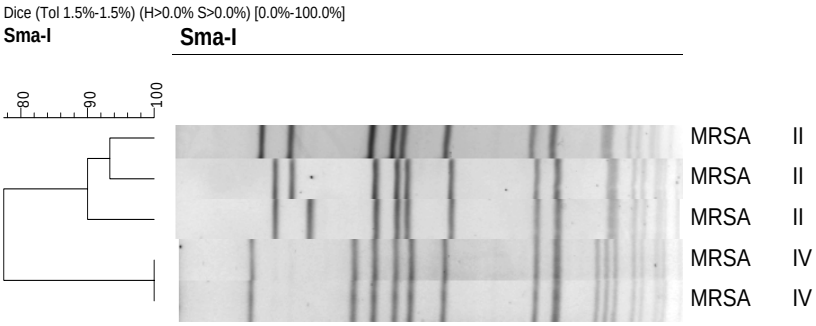

Figure 1: MRSA PFGE results showing isolates with mec types II and IV. The type IV isolates are matches while the type II isolates are not as evidenced by the banding patterns.

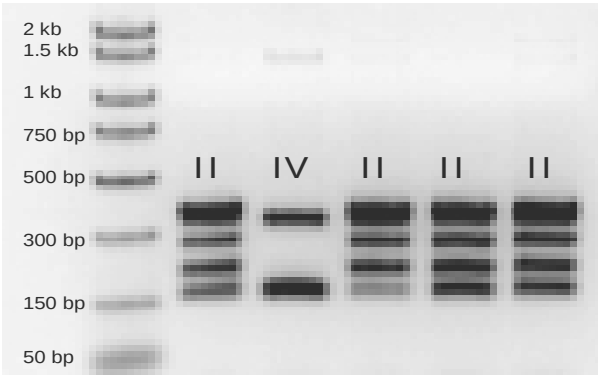

Figure 2: Multiplex PCR based SCCmec typing results show the banding patterns expected for a mec type II or type IV MRSA strain and three type II clinical isolates.

[1] Bancroft EA. 2007. Antimicrobial resistance It's not just for Hospitals. *JAMA* 298(15): 1803-4.

[2] Klevens R M, Morrison MA, Nadle J, Petit S. Gershman K, Ray S, Harrison LH, Lynfield R, Dumyati G, Townes JM, Craig AS, Zell ER, Fosheim GE, McDougal LK, Carey RB, and Fridkin SK. 2007. Invasive Methicillin-Resistant *Staphylococcus aureus* Infections in the United States. *JAMA* 298(15): 1763-71.

[3] McDougal LK, Steward CD, Killgore GE. 2003. Pulsed-Field Gel Electrophoresis typing of Oxacillin-resistant *Staphylococcus aureus* isolates from the United States: establishing a national database. *J Clin Microbiol* 41(11): 5113-2.

IBL Discontinues DFA-based Screening for *Bordetella pertussis*

Saige Harrington, Vivian M. Lockary, and Christopher L. Ball, Ph.D.

In a recently completed retrospective study of 460 samples submitted to the Idaho Bureau of Laboratories from September 2004 to February 2007, we compared the performance characteristics of the Accu-MAb™ Plus *Bordetella pertussis* direct fluorescent antibody (DFA) test (Altachem Pharma Inc, Edmonton, Alberta)[4] with fluorogenic probe based real time polymerase chain reaction (RT-PCR). The IBL has been utilizing both of these tests concurrently as screening methods for the detection of *B. pertussis* since 2004[5]. In a 2002 study, McGowan found that PCR was both more sensitive and specific than DFA[6] suggesting it was a potentially better screening test. Our results were somewhat comparable to that report as is shown in the table below. We found that while DFA had a better PPV and clinical specificity, RT-PCR was more accurate, had a better NPV, and was significantly more sensitive than DFA. Of particular concern in our study was the poor clinical sensitivity of the DFA method. Similarly low sensitivity values have also been reported in other studies employing both monoclonal and polyclonal DFA reagents[6]. Another potential DFA limitation is the correlation between clinical specificity and analyst experience. McGowan noted that several studies found false positive results occurring from 7-44% of the time when inexperienced laboratorians interpreted DFA smears[6]. Thus, our reported DFA clinical specificity (100%) is attributable to the fact that very experienced analysts are interpreting the results using the strictest of QA/QC guidelines.

Based on these study results, we are no longer offering DFA as a screening method at the IBL, but we will continue to use it as part of our polyphasic *B. pertussis* culture confirmation algorithm.

Comparison of selected *B. pertussis* DFA and Real Time PCR performance characteristics.

Performance Measure	DFA	RT-PCR
Accuracy	92.6%	96.4%
Positive Predictive Value (PPV)	100%	96.8%
Negative Predictive Value (NPV)	92.2%	96.4%
Clinical Sensitivity	43.3%	93.8%
Clinical Specificity	100%	98.2%

[4] Harrington S, Lockary V, and Ball CL. 2007. Evaluation of the Accu-MAb Plus *Bordatella pertussis* Direct Fluorescent Antibody Test and Recommendations for Its Use at the Idaho Bureau of Laboratories. *Acta IBL* 3: 22-24.

[5] Ball CL., Lockary V, and Malan A. 2005. Verification of the Cepheid *Bordetella pertussis* ASR with IC Real Time PCR Assay. *Acta IBL* 1: 23-26.

[6] McGowan KL. 2002. Diagnostic Tests for Pertussis: Culture vs. DFA vs. PCR. *Clin. Micro. Newsletter* 24(19): 143-149.